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borne by the trees. If one turns to the literature in search of work of a quantitative nature on the physiology of this taxonomically and morphologically diversified group of plants, his search will be practically in vain. Material progress has already been made in the study of the sap properties of some of the representative types, although it is quite too early to discuss in detail even this phase of the physiology of these plants.

Osmotic concentration in these forms is generally exceedingly low, Orchidaceæ from the Jamaican rain forest show an average of 3.34 atmospheres, those from the Florida hammocks an average of 4.88 atmospheres. Tank epiphytes from the Blue Mountains of Jamaica show concentrations ranging from 2.8 to 5.5 atmospheres. Comparable values are found in subtropical Florida.

The succulent *Peperomias* and some other epiphytic species are also characterized by a concentration of their tissue fluids only a fraction of that obtaining in the foliage of the arborescent plants of the same forests.

Thus, in general, epiphytic species are characterized by low osmotic concentration. This is not, however, a necessary condition of epiphytism. Determinations are available for at least one species of epiphytic fern showing a sap concentration roughly three times as high as that generally characteristic of the succulent Orchidaceæ and Piperaceæ and the tank Bromeliaceæ.

The keen botanical interest aroused by parasitic flowering plants has found expression in an enormous number of macroscopic and microscopic morphological and life-history investigations. Yet it should be clear that the problem of the distribution of parasitic forms, both among the possible host plants of a particular region

and from region to region, is primarily a physiological one. Among the possible factors, the relative concentration of the tissue fluids of the photosynthetic and transpiring organs of the host and parasite seems on *a priori* grounds one of the greatest importance. Studies on the osmotic concentration of the tissue fluids of Jamaican Loranthaceæ on various hosts have shown that in general but not invariably, the osmotic concentration of the fluids of the leaves, or of the leaf homologs, of the parasite is higher than that of those of the host.

In the foregoing discussion only a portion of the results of studies already made, but as yet largely unpublished, have been lightly touched upon. They are illustrative merely. For the mass of facts justifying generalization, the published tables must be consulted. Enough has, perhaps, been said to indicate the fundamental significance for the physiological phases of phytogeography of the physico-chemical measurements. As phytogeography becomes more and more a problem of the physiology of individual species of plants, investigated in their own environment, as methods become more precise, and as results are recorded and discussed in more quantitative terms, the ecologist's sector of the attack upon the great problem of the relationship of the organism to its environment will be increasingly successful. Concurrently, the relations of chemistry to botany will become more clearly defined in a field in which its existence has heretofore been little recognized, and the service of chemistry to botany will be increasingly great.

J. ARTHUR HARRIS

#### SCIENTIFIC EVENTS

##### MEMORIAL TO SIR WILLIAM RAMSAY

THE following appeal has been issued by a committee formed to raise a memorial to the late Sir William Ramsay.

A committee has been formed with the object of raising a suitable memorial to the late Professor Sir William Ramsay, K.C.B., F.R.S., by collecting a substantial fund to be utilized for the purpose of promoting chemical teaching and research.

The committee, after prolonged and careful consideration, has resolved to aim at raising a sum of £100,000, and to devote that sum to two principal objects, viz.:

1. The provision of Ramsay research fellowships, tenable wherever the necessary equipment may be found.

2. The establishment of a Ramsay Memorial Laboratory of Engineering Chemistry in connection with University College, London.

We should hesitate to ask for so large a sum of money in such exceptionally difficult times, were it not that the objects specified are objects of real and urgent national importance. The war has demonstrated in a manner previously unrealized the supreme importance of scientific, and, in particular chemical, research to the national life, both in the conduct of the war and in the pursuits of industry and manufacture.

The late Sir William Ramsay was himself engaged up to within a comparatively short time of his death in various important problems concerned with the bearing of chemistry upon the war, and no one realized more completely than he the potentialities of the plans which have since been formulated by this committee as a memorial to him.

It is important that the fund should be raised speedily, so that the plans for the laboratory of engineering chemistry and the scheme for the award of fellowships may be prepared before the end of the war, and so that both schemes may begin to operate with as little delay as possible after the return of peace.

Accordingly, we desire, through the columns of your paper, to appeal to friends and admirers of the late Sir William Ramsay, to old students, and to all persons who are interested in chemistry and its application to industry and manufacture, to contribute to this great national and international memorial to the late Sir William Ramsay, and to send their subscriptions to the honorable treasurers of the Ramsay Memorial Fund at University College, London, W.C.1.

H. H. ASQUITH,	} <i>President;</i>
D. LLOYD GEORGE,	
GAINFORD,	} <i>Vice-presidents;</i>
RAYLEIGH,	
REAY,	
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H. A. L. FISHER,	
J. J. THOMSON,	

HUGH BELL,  
GLENCONNER,

*Chairman of the Executive Committee;*  
*Treasurer.*

It is stated in *Nature* that the sum already subscribed by Ramsay's friends, and through their private efforts, amounts to more than £14,000. This includes the generous gift of £5,000 from Messrs. Brunner, Mond, Ltd.; £1,000 each from Lord Glenconner, Sir Hugh Bell, Sir Ralph C. Forster, Sir Robert Hadfield, Mr. Robert Mond, and Mr. J. B. Noble; and £500 each from the president of the British Science Guild (Sir William Mather), Mr. Charles Hawksley, and Miss Lillias Noble.

A memorial tablet, including a medallion portrait of Ramsay, is to be erected in the University of Glasgow, of which he was a graduate and teacher. The University Court has arranged that the memorial, which is designed by Sir John J. Burnet, shall be placed in a conspicuous position at the entrance to the Bute Hall.

#### SMITHSONIAN BOTANICAL EXPEDITIONS

A RECENT pamphlet on the field-work conducted by and for the Smithsonian Institution states that, while carrying on botanical explorations in Venezuela last fall, Dr. J. N. Rose, associate curator of plants in the National Museum, secured some interesting specimens of "sabadilla," a Venezuelan plant of the lily family, from the seeds of which are produced some of the asphyxiating and tear-producing gases used in the present war.

The specimens were secured by Dr. Rose through the cooperation of Consul Homer Brett, La Guaira, Venezuela, who stated in a report of the Department of Commerce, some time ago, that this plant is known locally as "cevadilla," a diminutive of the Spanish word "cebada," meaning barley, and occurs in Venezuela and Mexico. Its highly poisonous seeds have long been used in medicine. The substances produced from sabadilla seed are cavatine, or crystallized veratrin, an alkaloid; veratric acid, and sabadilline, a heart stimulant.

Neither the consular report nor the Smithsonian pamphlet gives the formula for the manufacture of the war gases, but it is stated